

## **Attachment 1**

Figure 2-1. Class 1 Areas and Major Source Locations

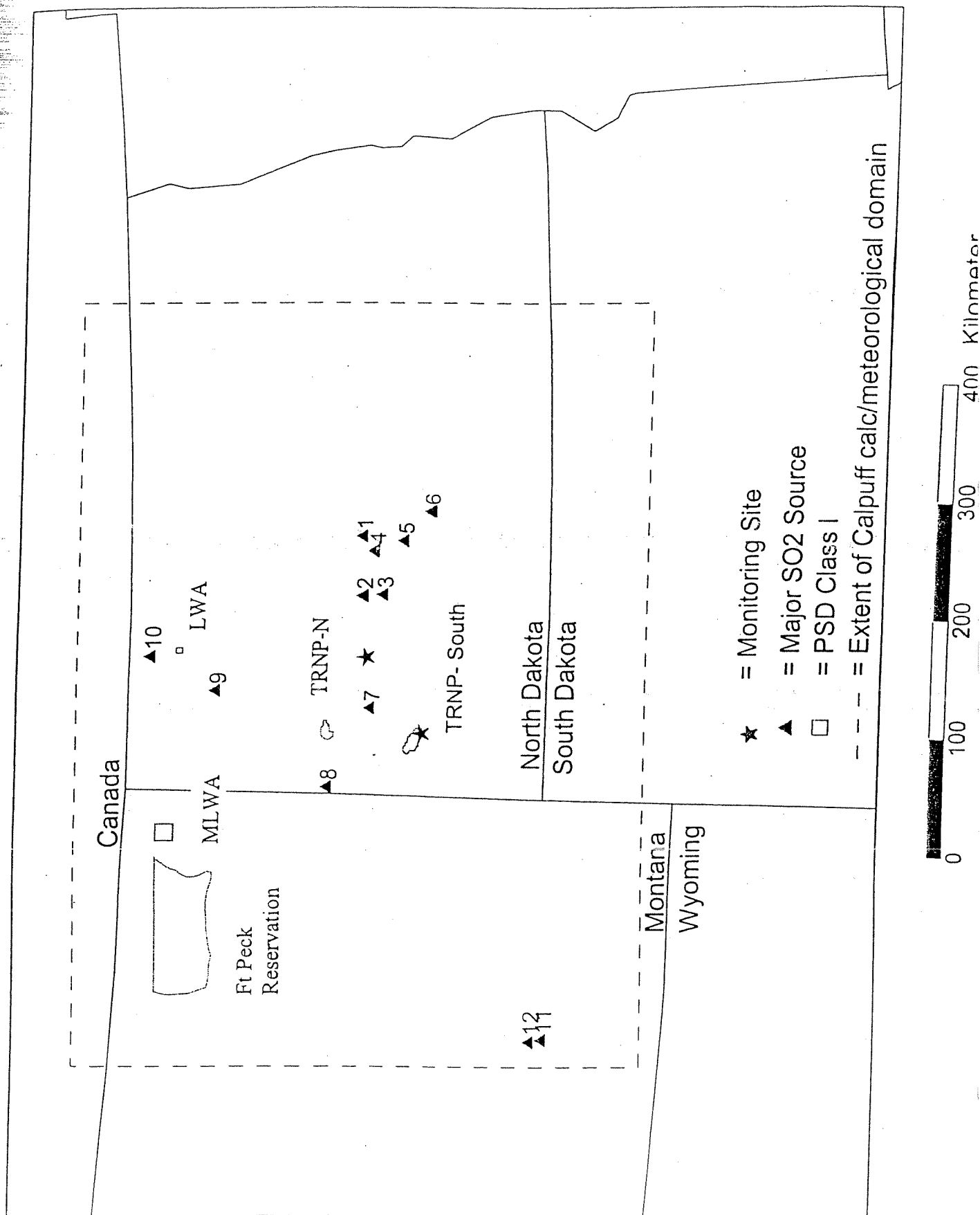


Figure 2-1. Key to Source Locations

1. Coal Creek Station
2. Antelope Valley Station, Great Plains Synfuels Plant
3. Coyote Station
4. Leland Olds Station, Stanton Station
5. Milton R Young Station
6. Heskett Station, Mandan Refinery
7. Little Knife Gas Plant
8. Grasslands Gas Plant
9. Tioga Gas Plant
10. Lignite Gas Plant
11. Colstrip Station
12. CELP Boiler

MLWA Medicine Lakes Wilderness Area

TRNP-N Theodore Roosevelt National Park- North Unit

TRNP-S Theodore Roosevelt National Park- South Unit

LWA Lostwood Wilderness Area

Figure 2-1. Key to Source Locations

1. Coal Creek Station
2. Antelope Valley Station, Great Plains Synfuels Plant
3. Coyote Station
4. Leland Olds Station, Stanton Station
5. Milton R Young Station
6. Heskett Station, Mandan Refinery
7. Little Knife Gas Plant
8. Grasslands Gas Plant
9. Tioga Gas Plant
10. Lignite Gas Plant
11. Colstrip Station
12. CELP Boiler

MLWA Medicine Lakes Wilderness Area

TRNP-N Theodore Roosevelt National Park- North Unit

TRNP-S Theodore Roosevelt National Park- South Unit

LWA Lostwood Wilderness Area

## **Attachment 2**



NORTH DAKOTA DEPARTMENT OF HEALTH  
Environmental Health Section

Location:

1200 Missouri Avenue  
Bismarck, ND 58504-5264

Fax #:

701-328-5200

Mailing Address:

P.O. Box 5520  
Bismarck, ND 58506-5520

October 21, 1999

RECEIVED  
AIR PROGRAM

OCT 25 1999

Mr. Dick Long, Director  
Air and Radiation Program  
Mail Code 8P-AR  
U.S. Environmental Protection  
Agency Region 8  
999 18<sup>th</sup> Street, Suite 500  
Denver, CO 80202-2466

*Dick*  
Dear Mr. Long:

Minnkota Power Cooperative has submitted a Permit to Construct application to the North Dakota Department of Health (NDDH) for a change in the method of operation at its Milton R. Young generating station located near Center, North Dakota. The application is for a permit revision which would allow Minnkota to operate the two station units at a higher load level than was stated as the maximum design capacity of the units. Air quality modeling analyses have been conducted to determine the impact of the proposed permit revision on ambient air quality standards and PSD (Prevention of Significant Deterioration) increments.

Modeling analyses for permit revision impact on ambient air quality standards and PSD Class II increments were prepared and submitted by Minnkota, and are currently under review by the NDDH. The NDDH conducted its own Class I area analysis, using the Calpuff long-range air quality model. The Class I area analysis revealed significant Milton R. Young contributions to numerous predicted exceedances of Class I increments at Theodore Roosevelt National Park, Lostwood and Medicine Lake (Montana) National Wilderness Areas, and at the redesignated Fort Peck Reservation (Montana). In addition, the analysis revealed the potential for adverse visibility impact at these Class I areas.

The attached draft report describes the Class I area analysis conducted by the NDDH. Minnkota, with the assistance of a consultant (ENSR), is currently reviewing the report. It is our understanding that you have received (or may receive) inquiries from Minnkota regarding assistance on Class I analysis methodology and input conditions provided by the EPA to the NDDH. This copy of the report is being furnished to provide an overview of the methodology employed by the NDDH, and to accommodate the fielding

Environmental Health  
Section Chief's Office  
701-328-5150

Environmental  
Engineering  
701-328-5188

Municipal  
Facilities  
701-328-5211

Waste  
Management  
701-328-5166

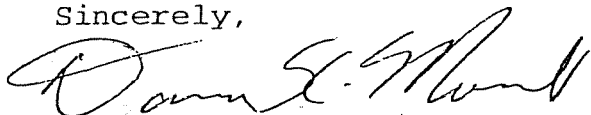
Water  
Quality  
701-328-5210

of questions from Minnkota. In addition, we would appreciate receiving any comments you may have regarding the methodology described in the draft report. A final report will be prepared based on comments received from the EPA Region 8, National Park Service, and Minnkota.

It should be noted that the model emission rates to be used by the NDDH for some nearby sources (Basin Electric Leland Olds Station Units 1 and 2, and Great River Energy's Stanton Station) have not been finalized. Depending on the outcome of the discussions with the companies, the modeled impact on PSD increment consumption by these sources may change.

If you have any questions regarding the NDDH report or modeling analysis, or are interested in computer files referenced in the report, please contact Steve Weber at 701-328-5188.

Sincerely,



Dana K. Mount, P.E.  
Director, Division of  
Environmental Engineering

DKM/SW:tf

Enc:

Calpuff Class I

Area Analysis

for

Milton R. Young

Generating Station

May 24, 1999

North Dakota Department of Health  
1200 Missouri Avenue, Room 304  
Box 5520  
Bismarck, ND 58506-5520



Because Calpuff/Calpost was predicting numerous exceedances of Class I increments, it was necessary to determine if the MRY station contributes significantly to any of these predicted exceedances. While Calpost can provide the number of predicted exceedances of a threshold value at a given receptor, it does not provide the value of each exceedance, nor any information on source contributions. Therefore, the NDDH developed the Calxceed program. Calxceed lists the value of each exceedance, the contribution of an individual source (or source group) to each exceedance, the total number of exceedances, and the number of exceedances with significant individual source contributions. These parameters are provided for each receptor for each threshold level (currently hard-coded as 3-hour and 24-hour SO<sub>2</sub> Class I increments). Calxceed requires two Calpuff-compatible hourly concentration files: one representing cumulative concentrations and the other reflecting individual source (source group) concentrations. Calxceed was executed to complete the MRY station Class I increment analysis.

The complete NDDH Calpuff postprocessing system includes components for visualizing output (using gridded receptors), which were utilized in the MRY station analysis.

#### 4.4 Results

Results of the Calpuff SO<sub>2</sub> modeling analysis for MRY station Class I increment consumption are summarized in Tables 4-2 and 4-3. Table 4-2 provides essential regulatory comparisons while Table 4-3 provides supplemental information on source contributions.

Table 4-2 provides the overall highest and highest, second-highest predictions for the five-year period of meteorological data. Values are provided for the worst-case year for each Class I area. Also provided in Table 4-2 is the maximum number of predicted exceedances of the applicable Class I increment (3-hour and 24-hour average) and the number of cases where MRY station significantly contributed to a predicted increment violation. Again, these values are provided for the worst-case receptor and year for each Class I area. Significant contributions are based on significant impact levels established by the NDDH<sup>3</sup>. Class I significant impact levels for SO<sub>2</sub> are 1.0 µg/m<sup>3</sup>, 0.2 µg/m<sup>3</sup>, and 0.1 µg/m<sup>3</sup> for 3-hour, 24-hour, and annual averages, respectively.

Table 4-2 summarizes Calpuff results for the five-year period modeled. Expanded results for individual years are provided in Appendix C.

The contributions of the MRY station and oil and gas facility (minor) sources to highest, second-highest predictions (3-hour and

Table 4-2  
Calpuff Class I Increment Results SO<sub>2</sub>\*  
(µg/m<sup>3</sup>)

	<u>TRNP South</u>	<u>TRNP North</u>	<u>TRNP Elkhorn R.</u>	<u>Lostwood Wilderness</u>	<u>Med. Lake Wilderness</u>	<u>Ft. Peck Reservation</u>
<u>3-hr Predictions</u>						
Highest	68.4	77.7	40.4	38.5	39.4	34.3
High, 2 <sup>nd</sup> High	45.0	43.0	36.5	34.3	30.2	33.5
Max # of Exceedances**	7	9	2	5	2	2
Max # sig. MRY contrib. to violations**	4	8	0	4	1	1
<u>24-hr Predictions</u>						
Highest	15.0	18.3	13.6	9.1	10.6	10.5
High, 2 <sup>nd</sup> High	13.4	12.7	13.2	8.6	7.1	7.4
Max # of Exceedances**	10	22	10	15	4	4
Max # sig. MRY contrib. to violations**	8	12	6	14	3	3
<u>Max Annual Prediction</u>	1.19	1.53	0.98	0.74	0.26	0.28

\* PSD Class I increments for SO<sub>2</sub> are 25 µg/m<sup>3</sup>, 5 µg/m<sup>3</sup>, and 2 µg/m<sup>3</sup> for 3-hour, 24-hour, and annual averages, respectively.

\*\* Worst-case receptor, year

Table 4-3  
Calpuff Class I Increment Source Contributions  
( $\mu\text{g}/\text{m}^3$ )

	<u>TRNP South</u>	<u>TRNP North</u>	<u>TRNP Elkhorn R.</u>	<u>Lostwood Wilderness</u>	<u>Med. Lake Wilderness</u>	<u>Ft. Peck Reservation</u>
<u>3-hr Predictions</u>						
High, 2 <sup>nd</sup> High	45.0	43.0	36.5	34.3	30.2	33.5
MRY Contribution	1.5	2.9	0.5	5.2	5.2	2.6
Oil & Gas Contrib.	0.1	0.04	3.2	0.01	---	---
Overall Max Contrib.						
MRY Station	5.6	10.1	1.4	7.2	5.2	5.5
Oil & Gas Sources	14.1	17.7	3.2	0.2	---	---
<u>24-hr Predictions</u>						
High, 2 <sup>nd</sup> High	13.4	12.7	13.2	8.6	7.1	7.4
MRY Contribution	1.1	0.8	0.7	1.5	1.0	1.0
Oil & Gas Contrib.	0.1	1.3	1.9	0.4	---	---
Overall Max Contrib.						
MRY Station	2.3	1.6	1.4	1.6	1.5	1.6
Oil & Gas Sources	7.0	9.6	2.9	0.5	---	---

24-hour) are summarized in Table 4-3. The highest, second-highest predictions reflect the worst-case year for each Class I area. Also shown in Table 4-3 is the overall highest contribution by MRY station, and by oil and gas sources, to predicted exceedances of the applicable Class I increment. These values reflect the highest contribution for the five modeled years at each Class I area.

As shown in Table 4-2, Calpuff predicts numerous exceedances of PSD Class I increments. The highest, second-highest 3-hour average prediction at Theodore Roosevelt National park (TRNP) is  $45.0 \mu\text{g}/\text{m}^3$  at the South Unit, which compares with the Class I increment of  $25 \mu\text{g}/\text{m}^3$ . The highest, second-highest 24-hour average prediction (TRNP South Unit),  $13.4 \mu\text{g}/\text{m}^3$ , compares with the Class I increment of  $5 \mu\text{g}/\text{m}^3$ . The maximum number of increment exceedances (worst-case year and receptor ) were found at TRNP North Unit, with 9 exceedances of the 3-hour increment and 22 exceedances of the 24-hour increment predicted. According to Calpuff results, the MRY station significantly contributed to (at most) eight 3-hour increment violations at TRNP North Unit, and fourteen 24-hour increment violations at Lostwood Wilderness Area.

The contributions of MRY station and oil and gas sources to the highest, second-highest prediction (3-hour and 24-hour average) at each Class I area is shown in Table 4-3. While these contributions are relatively small, particularly for oil and gas sources, the overall maximum contributions are much greater. As shown in Table 4-3, the maximum 3-hour contribution from MRY station is  $10.1 \mu\text{g}/\text{m}^3$  at TRNP North Unit. The maximum 24-hour contribution from MRY station is  $2.3 \mu\text{g}/\text{m}^3$  at TRNP South Unit. For oil and gas sources, the maximum contributions were  $17.7 \mu\text{g}/\text{m}^3$  and  $9.6 \mu\text{g}/\text{m}^3$  for 3-hour and 24-hour averages, respectively. For the ensemble of predicted increment exceedances, however, the MRY station was generally a larger contributor, and more often a significant contributor, than oil and gas sources.

### **Attachment 3**



## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 8

999 18<sup>TH</sup> STREET - SUITE 500

DENVER, CO 80202-2466

<http://www.epa.gov/region08>

Ref: 8P-AR

FEB 1 2000

Jeff Burgess, Director  
Division of Environmental Engineering  
State Department of Health  
P.O. Box 5520  
Bismarck, North Dakota 58506-5520

Dear Jeff:

I am writing in response to the State's October 21, 1999 submittal of your draft Calpuff Class I area analysis, which was completed to determine the impact of the proposed increase in production rate at the Minnkota Power Cooperative's Milton R. Young generating station. The draft report revealed significant contribution to numerous predicted exceedances of Class I prevention of significant deterioration (PSD) increments at Theodore Roosevelt National Park, Lostwood and Medicine Lake National Wilderness Areas, and at the Fort Peck Indian reservation. The analysis also showed potential for adverse visibility impact at these Class I areas.

We have reviewed the methodology used in the modeling analysis, and we believe that the State has conducted a technically sound modeling analysis. We believe the analysis is consistent with EPA's Guideline on Air Quality Models and the recommendations of the Interagency Workgroup on Air Quality Modeling for evaluating impacts on Class I areas. Thus, we have no comments on the methodology used in this analysis.

However, we believe there should be more discussion in the report that documents how the source emissions inventory was derived for the Class I increment and visibility analysis. It is not clear what the numbers in the major source inventory (Table 4-1) represent or how the emissions data was calculated. The report should also include documentation of the minor source emissions inventory that was used in the analysis. In addition, the State should pursue acquiring an inventory of minor source emissions within 50 kilometers of Montana's Class I areas. We recently learned that the Fort Peck Tribe is interested in performing an increment consumption analysis for its Class I Indian reservation. The State may want to collaborate with the Tribe to improve this analysis for the Fort Peck Class I area. Deb Madison is the contact with the Fort Peck Tribe's air program, and she can be reached at (406) 768-5155.

The source emission inventory section of the report should also include documentation to verify that the emissions modeled are increment-consuming emissions. As you know, increment is generally consumed by the actual emissions from 1) any major stationary source for which construction began after the major source baseline date (which for SO<sub>2</sub> is January 6, 1975); 2)



existing major stationary sources having undergone a physical change or change in the method of operation after the major source baseline date; 3) existing stationary sources having undergone a physical change or change in the method of operation, or having increased hours of operation or capacity utilization, after the minor source baseline date; 4) new stationary sources which constructed after the minor source baseline date; and 5) changes in emissions from area and mobile sources since the minor source baseline date. Also note that the proper minor source baseline date to consider in an increment consumption analysis is the minor source baseline date for the area that is being modeled for impacts. Thus, for the Fort Peck Indian Reservation and the Medicine Lakes Wilderness Area which are within the "Rest of State" SO<sub>2</sub> attainment area in Montana, the minor source baseline date for SO<sub>2</sub> is March 26, 1979. (Note that Vicki Stamper, of my staff, previously provided your staff with a SO<sub>2</sub> minor source baseline date for Montana of November 29, 1979, which we recently realized was incorrect. We apologize for any confusion this has caused.) The minor source baseline date for the Class I areas in the North Dakota "Rest of State" SO<sub>2</sub> attainment area (AQCR 130) should be used in developing the emissions inventory for the Class I increment modeling which, based on our files, appears to have been triggered on January 13, 1978.

EPA would like to clarify two other issues associated with this increment modeling analysis that have been raised by the State. The first issue concerns the Fort Peck Indian Reservation, which was redesignated to Class I air quality status in 1984. Prior to the Tribe's redesignation to Class I, several PSD permits were issued, and these sources only had to demonstrate compliance with the Class II increment at Fort Peck. Your staff has posed the question of whether the Class I increment at Fort Peck should apply to these facilities now. Based on research and discussions with our Office of General Counsel (OGC), EPA believes the Class I increment applies in the Fort Peck Indian Reservation for all sources that consume increment, regardless of whether the sources received permits before the Tribe's redesignation in 1984. The Alabama Power Court Decision explains that significant deterioration may occur due to, among other things, redesignation to a more restrictive air quality classification, and that the State may need to revise the SIP to include such measures as may be necessary to protect the increment. [See *Alabama Power Co. v. Costle*, 636 F.2d 323 at 362 (D.C. Circuit 1979).] The court decision further explains that the PSD permitting process is not the only means of protecting the increments. Thus, EPA believes that all increment consuming sources must be modeled for compliance with the Class I increments at Fort Peck.

The second issue pertains to the Class I variances granted by the Federal Land Managers (FLMs) for certain PSD permits in North Dakota. This issue was raised by Dana Mount in a December 13, 1999 conference call between the State, EPA, the National Park Service (NPS), and the Fish and Wildlife Service (FWS). Specifically, Dana asked whether the Class I increment should apply in Theodore Roosevelt National Park and Lostwood Wilderness Area for the facilities which had been granted Class I variances in the past. We've done some research on this issue and discussed the topic with OGC, and we believe the Class I increment still applies in these areas for all of these facilities.

These Class I variances were granted pursuant to the provision in the PSD permitting regulations that allows a source which is projected to cause or contribute to a violation of a Class I increment to demonstrate to the FLM that its emissions won't have an adverse impact on the air quality related values (AQRVs) of the Class I area. If the FLM agrees that the source won't adversely impact the AQRVs, then the State can issue the PSD permit with such emission limits as necessary to ensure that the source won't exceed certain concentrations over baseline concentration specified in the rules (i.e., generally, the level of the Class II increments - except for the 3-hour SO<sub>2</sub> increment). However, in such cases, the State is still required to correct the Class I increment violation, which could be accomplished by obtaining reductions from other increment-consuming sources or by expanding the increment through reductions in emissions from baseline sources. The Alabama Power Court Decision explains that, although the Class I variance does treat the applicable PSD source with special consideration, the "totality of facilities...may be subject to measures necessary to cope with a condition of pollutants exceeding the PSD maximum." [See Alabama Power Co. v. Costle, 636 F.2d 323 at 363 (D.C. Circuit 1979).] Thus, although the FLMs granted variances for these PSD facilities, the State should have revised the SIP to correct the increment violations. Alternatively, EPA could have issued a call for a SIP revision pursuant to 40 CFR 51.166(a)(3), which we still could do.

While we realize that this report is currently in draft form, EPA is concerned with the results of this draft modeling analysis. EPA believes the State must address the increment violations potentially caused by Minnkota's increase in emission before it can issue a revised permit to the Milton R. Young facility to increase its production rate. The Milton R. Young facility was identified as one of the facilities that could potentially increase its SO<sub>2</sub> emissions, as a result of the revisions to Section 33-15-02-07 of the North Dakota Administrative Code (NDAC) which exempted coal conversion facilities from meeting the State ambient standards for SO<sub>2</sub>. As required by EPA to gain approval of this SIP revision, the State adopted a provision in section 33-15-14-02.3c of the NDAC which requires any owner or operator of a source requesting an increase in its allowable SO<sub>2</sub> emission rate to demonstrate that the revised allowable emissions will not cause or contribute to a violation of the national ambient air quality standards (NAAQS) or PSD increments for SO<sub>2</sub> or violate any other applicable requirement. Based on this provision, which was approved into the SIP on August 31, 1999 (64 FR 47401), it appears that the State will not be able to issue the permit to allow Milton R. Young facility to increase their allowable SO<sub>2</sub> emission rate without requiring emission reductions to ensure that no violations of the PSD increment will occur.


In addition, if there are still existing increment violations due to the PSD sources for which the FLMs granted a Class I variance, the State needs to address these increment violations as well. Since the State will probably need to obtain reductions from the same sources (including, potentially, the Milton R. Young facility) in order to issue the permit for increased production at the Milton R. Young facility, the State should consider addressing all of the increment violations in one effort. The State should remember that these increment violations can be remedied in a few different ways, including reducing emissions of increment-consuming sources and expanding the available increment by reducing emissions of baseline sources. We realize that this may be a



difficult process, but we believe these increment problems must be addressed to comply with the intent of part C of the Clean Air Act.

We would greatly appreciate receiving a copy of the modeling analysis for Class I area impacts, once finalized, as well as the NAAQS and Class II increment analysis being performed by consultants for the Minnkota Power Cooperative. Once those analyses are final, we would gladly provide assistance, if needed, in developing options for dealing with any increment problems or other violations. If you have any questions on this letter or would like to discuss these issues further, please feel free to contact me at (303) 312-6005. Alternatively, your staff can contact Vicki Stamper at (303) 312-6445 or, for specific questions on modeling, contact Kevin Golden at (303) 312-6442 .

Sincerely,



Richard R. Long, Director  
Air and Radiation Program

cc: Dana Mount, ND Department of Health  
Tom Bachman, ND Division of Environmental Engineering

## **Attachment 4**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 8  
999 18<sup>TH</sup> STREET - SUITE 300  
DENVER, CO 80202-2466  
<http://www.epa.gov/region08>

MAR 28 2001

Ref: 8P-AR

Francis J Schwindt, Chief  
Environmental Health Section  
State Department of Health  
P.O. Box 5520  
Bismarck, North Dakota 58506-5520

Dear Fritz:

The purpose of this letter is to follow up on our January 10, 2001 meeting in Bismarck and on your subsequent March 13, 2001 letter with the Department of Health's commitments regarding the violations of the prevention of significant deterioration (PSD) increments for sulfur dioxide (SO<sub>2</sub>). As was discussed in our meeting, EPA is very concerned about the PSD increment violations, which have been modeled by the Department of Health in conjunction with Minnkota Power Cooperative's request to increase production at its Milton R. Young coal-fired power plant. Although we know the State denied the permit to increase production at Minnkota, a subsequent analysis submitted to EPA by your staff on April 19, 2000 showed that, even without Minnkota's increase in SO<sub>2</sub> emissions, there were still numerous violations of the three-hour and twenty four-hour PSD increments for SO<sub>2</sub> modeled in four Class I areas -- Theodore Roosevelt National Park (in all three units) and the Lostwood Wilderness Area, as well as the Medicine Lakes Wilderness Area and the Fort Peck Class I Indian Reservation, both of which are within Montana.

As you know, the Clean Air Act provides that the increments are not to be exceeded and that the State Implementation Plan (SIP) must contain measures assuring that the increments will not be exceeded. In addition, EPA's PSD regulations require that the SIP be revised to correct any increment violations which the State or EPA determines are occurring. (See 40 CFR 51.166(a)(3).) Because we had information that these Clean Air Act requirements were being violated, EPA contemplated issuing a SIP call to require North Dakota to revise its SIP.

In our January 10, 2001 meeting, you explained that the State needs to refine its previous modeling analysis before you could determine the appropriate control strategy to address the violations. You also expressed concern about the imposition of a formal SIP call. Instead, you pledged that the State would initiate refinements to the modeling analysis and would adopt revisions to the SIP as may be necessary to protect the PSD increment based on the revised analysis. I was very pleased with the State's willingness to address the increment violations in a

EPA8SIP003564



Printed on Recycled Paper

timely manner and appreciate the opportunity to address these violations through a partnership effort with the State in lieu of a formal SIP call. Thus, in light of your March 13, 2001 commitment letter, EPA will not initiate formal action to call for a SIP revision to address these violations. We acknowledge that the State needs to refine the modeling analysis to better determine the appropriate control strategy(ies) to address the violations, and we look forward to working with you and your staff to determine an acceptable modeling protocol. We also look forward to assisting the State in developing an acceptable control strategy(ies) to address the increment violations, including adequate time frames for implementation which may vary depending on the control strategy(ies) ultimately required by the State.

We note the following commitments, as outlined in your March 13, 2001 letter:

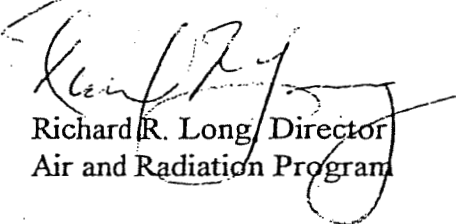
- **By April 1, 2001** - The State will develop an air quality modeling protocol.
- **By January 2, 2002** - The State will complete its modeling analysis (or within nine months from the time EPA completes its review of the modeling protocol).
- **By February 1, 2002** - The State will provide EPA with a summary of its modeling analysis.
- **By August 1, 2003** - The State will complete a SIP revision to resolve the increment issue (if the modeling analysis shows that the increment is exceeded).

If the State does not meet these commitments, or if the State and EPA cannot agree on an acceptable modeling protocol or on acceptable control measures, then EPA may decide at some point in the future to initiate a formal SIP call.

As agreed to in our January 10, 2001 meeting, EPA will publish an informational notice in the **Federal Register** in the near future to inform the public of the process by which the State and EPA intend to address these increment violations; however, this information notice will not make the State's commitments legally binding in any way. We will send you a copy once it is published in the **Federal Register**.

If you have any questions regarding this matter, please feel free to contact me at 303-312-6005. We look forward to working with you to resolve the PSD increment issues in these Class I airsheds.

Sincerely,



Richard R. Long, Director  
Air and Radiation Program

cc: Jeff Burgess, NDDH  
Christine Shaver, NPS  
Sandra Silva, USFWS  
Deb Madison, Assiniboine and Sioux Tribes  
Bob Raisch, MDEQ